

## Chemistry I: How to solve mole problems

### 1. Things you need to know about the mole.

- A. The **mole is the standard unit of measurement in chemistry** for indicating the amount of a substance present.
- B. The symbol for mole is "**mol**"
- C. **molar mass** is the sum of all of the atomic weights of all of the atoms of all of the elements in the substance.
- D. 1 mole of particles =  **$6.02214 \times 10^{23}$**  particles for any substance!
- E. **1 mole of atoms has a mass equal to the atomic weight in grams.**
- F. 1 mole of any gas will occupy **22.4 liters at standard temperature and pressure**

Standard temperature is 0°C or 273.15 K

Standard pressure is 29.92 in Hg or 1 atmosphere or 760 mm Hg

### 2. Mole Problems

- A. Read the problem to determine what info is given and what is being asked.
  - 1. If the problem has multiple parts, break it down into parts.
  - 2. Decide if other information is needed, such as atomic weights or molar mass.
  - 3. Make a concept map of the problem, if needed.
  - 4. Be sure to label your numbers with the proper units
- B. look at the answer, to be sure it makes sense.

### 3. Example:

How many grams of sodium hydroxide are in 1.25 mol NaOH?

**Given:** 1.25 moles NaOH

**asked for:** # grams NaOH

$$1.25 \text{ mol NaOH} \times 40 \text{ g/mol} = 50 \text{ g NaOH}$$